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Declass Review by NGA

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30 December 1966

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The proposed modification consists of an accessory eyepiece assembly which fits onto the [] Versatile Microscope and permits the eyepieces to be moved out toward the operator by approximately eight inches. The angle of the eyepiece is also changed to a more favorable one. No modifications or changes are required of the microscope. The same interchangeable eyepieces are merely moved closer to the operator by use of a 1:1 relay system with associated mirrors and field lens.

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By using the proposed accessory eyepiece the following advantages are realized:

1. The tilt of the eyepiece can be optimized from the human engineering standpoint.
2. The advantages of the present design of the machine are retained. No changes in carriages are necessary. The "Y" motion remains relatively small, i.e., 6", where all the knobs are convenient to the operator. It also retains the advantages that rhomboids cannot accidentally hit the support casting.
3. The eyepieces are interchangeable. The operator can still use a drafting stool and use same eyepieces, without relays.
4. The operator may use the equipment when the rhomboids are swung toward the observer. He can easily position the pointer over the area of interest.
5. The operator can view the whole format with the microscope.

The proposed system already has been breadboarded in [] Optical Laboratory using the [] Versatile Microscope. Performance was found to be excellent. Using the same [] 10X wide angle eyepiece, the resolution and field of view was checked before and after the addition of the relay optics. It was apparent that the deterioration of resolution is less than 10% and is, in effect, hardly measurable. The field of view remains unchanged. Light loss will be held to less than 20% by use of coated lenses and high efficiency reflecting mirrors.

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The assembly will be constructed to the highest commercial standards.

An aluminum alloy will be used for main parts to minimize weight and all other metal parts will be of corrosion resistant materials. The weight of the unit will not exceed 1.5 pounds. Interpupillary distance will be adjustable from 55 to 75mm and a locking device will be provided.

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The development effort will begin with analysis of the human engineering aspects of the viewing problem to determine the most favorable position of the eyepieces for most operators. This will be followed by a breadboard system to determine exact performance characteristics and to finalize the optical components. The final design will then be converted to manufacturing drawings and a prototype unit fabricated. We believe, that with a reasonable effort, this whole development process will take six weeks.

[] has evaluated the cost of performing the design and modification of the microscope extension as described above. The cost analysis sheet is attached. We request that the contract be modified by increasing the contract value by []. The target fee would be increased by []. All other terms and conditions of the contract, including incentive, remain as at present. Effort on final assembly and checkout of the Model 635 will continue without interference with this proposed modification. Once [] receives authority to proceed with the proposed modification, we will require six weeks to final delivery of the end item as modified. This quotation shall remain valid for sixty (60) days from the date of this letter. If we can provide any additional information, please don't hesitate to contact us.

The Contracting Officer's technical representative has requested a budgetary price for a production quantity of these microscope extensions. Very little time has been allowed for making such a budgetary estimate, but to our best knowledge it is believed at this time the production price will be as follows:

QuantityPrice

10
20
40

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We would suggest that if you are interested in a production quotation for the microscope extension, the formal request for quote be submitted, at which time a finalized price will be sent.

Very truly yours,

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[]
Executive Vice President

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Enc. (2) Cost Analysis Sheet

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